

AMENDMENTS TO THE SPECIFICATION

Please amend Paragraphs [0009], [0065], [0110], [0137], [0291] and [0294] of the specification as follows:

[0009] Also, many of the aforementioned patents and applications recognize that the walls surrounding the discrete microcapsules in an encapsulated electrophoretic medium could be replaced by a continuous phase, thus producing a so-called "polymer-dispersed electrophoretic display" in which the electrophoretic medium comprises a plurality of discrete droplets of an electrophoretic fluid and a continuous phase of a polymeric material, and that the discrete droplets of electrophoretic fluid within such a polymer-dispersed electrophoretic display may be regarded as capsules or microcapsules even though no discrete capsule membrane is associated with each individual droplet; see for example, WO 01/02899, at page 10, lines 6-19. See also copending Application Serial No. 09/683,903, filed February 28, 2002 (Publication No. 2002/0131147), the entire disclosure of which is herein incorporated by reference, and the corresponding International Application PCT/US02/06393 (Publication No. WO 02/075443).

[0065] Figures 4A and 4B illustrate a polymer-dispersed electrophoretic medium of the present invention and the process used to produce this medium. This polymer-dispersed medium contains non-spherical droplets and is prepared by using a film-forming material which produces a film capable of being shrunk substantially after its formation. The preferred discontinuous phase for this purpose is gelatin, although other proteinaceous materials, and possibly cross-linkable polymers may alternatively be employed. A mixture of the liquid material (which will eventually form the continuous phase) and the droplets is formed and coated on to a substrate to form a structure as illustrated in Figure 4A. Figure 4A shows a layer 410 comprising droplets 412 dispersed in a liquid medium 414 which is in the process of forming a film, this layer 410 having been coated on a substrate 416 (preferably a flexible polymeric film, such as a polyester film) previously provided with a layer 418 of a transparent electrically conductive material, such as indium-tin oxide. The liquid material forms a relatively thick layer 410

containing essentially spherical droplets 412; as shown in Figure 4A. After the layer 410 has formed a solid continuous phase, the layer is then allowed to dry, preferably at about room temperature (although the layer may be heated if desired) for a period sufficient to dehydrate the gelatin, thus causing substantial reduction in the thickness of the layer and producing the type of structure illustrated in Figure 4B, the dried and shrunken layer being designated 410' in Figure 4B. The vertical shrinkage of the layer (i.e., the shrinkage perpendicular to the surface of the substrate 416) in effect compresses the original spherical droplets into oblate ellipsoids whose thickness perpendicular to the surface is substantially smaller than their lateral dimensions parallel to the surface. In practice, the droplets are normally sufficiently closely packed that the lateral edges of adjacent droplets contact each other, so that the final forms of the droplets more closely resemble irregular prisms than oblate ellipsoids. Also as shown in Figure 4B, more than one layer of droplets may be present in the final medium. When the medium is of the type shown in Figure 4B in which the droplets are polydisperse (i.e., a wide range of droplet sizes are present), the presence of such multiple layers is advantageous in that it reduces the chance that small areas of the substrate will not be covered by any droplet; hence, the multiple layers help to ensure that the electrophoretic medium is completely opaque and that no part of the substrate is visible in a display formed from the medium. However, in a medium using essentially monodisperse droplets (i.e., droplets all of substantially the same size), it will generally be advisable to coat the medium in a layer which, after shrinkage, will produce a close-packed monolayer of droplets, cf. copending Application Serial No. 09/413,444, filed October 6, 1999 (Publication No. 2003/0137717), and the corresponding International Application No. PCT/US99/ 23313, Publication No. WO 00/20922. Because they lack the relatively rigid microcapsule walls found in microencapsulated electrophoretic media, the droplets in polymer-dispersed media of the present invention may tend to pack more tightly into a close-packed monolayer than do microcapsules.

[0110] RGP processes of the invention in which particles bearing polymerizable

groups are reacted with a monomer in the presence of an initiator will inevitably cause some formation of "free" polymer not attached to a particle, as the monomer in the reaction mixture is polymerized. The unattached polymer may be removed by repeated washings of the particles with a solvent (typically a hydrocarbon) in which the unattached polymer is soluble, or (at least in the case of metal oxide or other dense particles) by centrifuging off the treated particles from the reaction mixture (with or without the previous addition of a solvent or diluent), redispersing the particles in fresh solvent, and repeating these steps until the proportion of unattached polymer has been reduced to an acceptable level. (The decline in the proportion of unattached polymer can be followed by thermogravimetric analysis of samples of the polymer.) Empirically, it does not appear that the presence of a small proportion of unattached polymer, of the order of 1 per cent by weight, has any serious deleterious effect on the electrophoretic properties of the treated particles; indeed, in some cases, depending upon the chemical natures of the unattached polymer and the suspending fluid, it may not be necessary to separate the polymer-coated particles from the unattached polymer before using the particles in an electrophoretic display.[.]

[0137] If a bistable electrophoretic medium is desired, it may be desirable to include in the suspending fluid a polymer having a number average molecular weight in excess of about 20,000, this polymer being essentially non-absorbing on the electrophoretic particles; poly(isobutylene) is a preferred polymer for this purpose. See Application Serial No. 10/063,236 filed April 2, 2002 (Publication No. 2002/0180687; the entire disclosure of this copending application is herein incorporated by reference), and the corresponding International Application No. PCT/US02/10267 (Publication No. WO 02/079869).

[0291] Copper ~~chromate~~ chromite (Shepherd Black 1G, 50 g) was treated with sodium silicate and sulfuric acid solutions in the same way as described in Example 1 above, up to the point at which the reaction mixture was cooled to room temperature. Additional sulfuric acid (18 mL of 1M acid) was then added to the reaction mixture to

lower its pH from about 9.5-10 to about 3. The reaction mixture was then placed in plastic bottles and centrifuged at 3700 rpm for 15 minutes, and the supernatant liquid decanted. Immediately after this decantation, deionized water (5 mL) and ethanol (50 mL) were added to each bottle, which was then shaken vigorously. The bottles were then sonicated for 1 hour. Microscopic investigation of the resultant dispersion revealed well-dispersed primary pigment particles.

[0294] Numerous changes and modifications can be made in the preferred embodiments of the present invention already described without departing from the spirit and skill of the invention. For example, the electrophoretic media and displays of the present invention may contain magnetic particles, as described in Application Serial No. 10/063,655 filed May 7, 2002 (Publication No. 2002/0171910; the entire disclosure of this application which is herein incorporated by reference) ~~and the corresponding International Applications filed on the same day~~. Accordingly, the foregoing description is to be construed in an illustrative and not in a limitative sense.